long bristles; fourth tarsal segment short but not cordiform; empodium very short or absent; claws of female rather large, equal or slightly unequal. Wings broad, usually milky, owing to absence of microtrichiae; macrotrichiae absent or confined to a few at apical margin; costa reaching more or less beyond middle; two radial cells normally present, about equal in size; cross-vein r–m slightly oblique; intercalary fork indistinct; median fork with rather long stem or lower branch widely interrupted or absent; alula and squame bare. Male genitalia not inverted; ninth tergite small; coxites swollen; harpes separate.

The Australian species we have seen, from Sydney and northern New South Wales, would fall into the genus *Brachypogon* (Kieffer, J. J., 1899. *Bull. Soc. ent. France*, p. 69; genotype, *Ceratopogon vitiosus* Winnertz) now included in the synonymy of *Ceratopogon* by most authors.

We do not think that *Ceratopogon* is either common or widely represented in Australia, as very few specimens have been included in our general collecting in recent years.

2. The Genus Culicoides.

(a) New Species.

(i) *Species in which the Distal Portion of the Second Radial Cell is Dark.*

Culicoides coronalis, n. sp.

Types: Holotype ♀ and three ♀ paratypes, all on slides in S.P.H.T.M.

Type Locality.—Prince of Wales I., North Queensland, 31:xii:1952, 2000–2100 hours, on sandy beach (J. Menner).

Distinctive Characters.—The indefiniteness of the wing pattern associated with entirely dark radial cells means that *C. coronalis* could only be confused with *C. immaculatus*, *C. austropalpalis* and *C. subimmaculatus*. Since the fourth segments of the tarsi are not cordate it should not be misidentified as *C. subimmaculatus*. The absence of a pale area over r–m, together with the form of the palp distinguishes the present species from *C. austropalpalis* and from *C. immaculatus*, to which it comes closest. It is distinct in the terminal segment of the palp and the interorbital space.

Description.—From the type series. No pinned material available for coloration details. Measurements from holotype and selected series comprising three paratypes. (See Table 1.)

Female.

Legs uniformly light brown, halteres brownish. Wings (Plate ix, fig. 1) with no pattern, only slightly pale areas below the radial cells and in intercalary fork.

Head: Eyes well separated (Text-fig. 1). Antennae (Text-fig. 17) with segments 3–10 cylindrical but not much longer than broad, 11–15 distinctly longer, giving definite contrast between proximal and distal segments. Segment III of palp very distinctly swollen on one side and with single round sensory pit in the distal half (Text-fig. 9), segment IV very small, shorter than V. Mouthparts about equal in length to height of head.

Thorax: Legs unmodified, tarsus IV subcylindrical, tibial comb of five spines.

Abdomen: Two fully-formed spherical spermathecae (Text-fig. 24). The chitinized plate of the seventh abdominal segment in the form of a distally directed crown (Text-fig. 32).

Male.

This sex has not been taken.

Distribution.—Queensland: Only known from the type locality.

Culicoides williwilli, n. sp.

Types: Holotype ♀, allotype ♂ and six ♀ paratypes. All slide specimens in S.P.H.T.M. except one paratype in each of C.S.I.R.O. and Q.I.M.R.

Type Locality.—Bundy, via Moree, New South Wales, 1:xi:1951, light trap (A. L. Dyce).

TABLE 1.

Measurements of Various Species of Culicoides.

		moreensis.	*coronalis.*	*bunrooensis.*	*williwilli.*	*nattaiensis.*	*bundyensis.*	*multimaculatus.*[1]	*waringi.*
♀♀									
Wing length ..	Holotype	0·91 mm.	1·09 mm.	1·10 mm.	1·14 mm.	1·20 mm.	1·09 mm.	1·85 mm.	2·21 mm.
	Average of selected series ..	0·91 mm.	1·04 mm.	1·07 mm.	1·14 mm.	1·20 mm.	1·21 mm.	1·79 mm.	2·25 mm.
	Range in above	0·89–0·95 mm.	1·03–1·05 mm.	1·03–1·12 mm.	1·12–1·16 mm.	1·16–1·25 mm.	1·20–1·25 mm.	1·61–1·89 mm.	2·06–2·41 mm.
Antenna	Holotype, 3–10	260 μ	275 μ	200 μ	180 μ	190 μ	225 μ	360 μ	405 μ
	,, 11–15	260 μ	260 μ	215 μ	230 μ	240 μ	215 μ	345 μ	370 μ
	Average of selected series:								
	3–10	250 μ	260 μ	215 μ	170 μ	215 μ	250 μ	335 μ	380 μ
	11–15	250 μ	260 μ	190 μ	240 μ	265 μ	265 μ	345 μ	370 μ
Palp	Holotype, segment 2	50 μ	45 μ	45 μ	30 μ	35 μ } [3]	55 μ	80 μ	85 μ
	,, ,, 3	55 μ	70 μ	55 μ	45 μ	45 μ } [3]	45 μ	90 μ	70 μ
	,, ,, 4	15 μ	30 μ	25 μ	20 μ	20 μ } [3]	25 μ	35 μ	35 μ
	,, ,, 5	25 μ	45 μ	20 μ [2]	25 μ	25 μ } [3]	30 μ	40 μ	45 μ
Hind leg	Holotype, femur	345 μ	445 μ	335 μ	370 μ	360 μ	345 μ	570 μ	655 μ
	,, tibia	325 μ	395 μ	335 μ	345 μ	385 μ	345 μ	600 μ	685 μ
	,, tarsus I ..	165 μ	240 μ	165 μ	165 μ	165 μ	145 μ	285 μ	310 μ
	,, ,, II ..	85 μ	105 μ	70 μ	70 μ	75 μ	75 μ	145 μ	155 μ
	,, ,, III ..	50 μ	50 μ	50 μ	45 μ	50 μ	50 μ	95 μ	105 μ
	,, ,, IV ..	35 μ	35 μ	35 μ	25 μ	35 μ	35 μ	60 μ	60 μ
	,, ,, V ..	45 μ	45 μ	45 μ	45 μ	45 μ	50 μ	60 μ	85 μ
	Average of selected series:								
	Tarsus I	145 μ	225 μ	155 μ	165 μ	170 μ	180 μ	275 μ	335 μ
	,, II	75 μ	105 μ	75 μ	70 μ	75 μ	95 μ	145 μ	170 μ
Spermathecae ..	Holotype *a*	45×30 μ	60×50 μ	45×30 μ } [4]	45×35 μ } [5]	55×35 μ } [6]	45×35 μ } [7]	75×50 μ	90×80 μ
	,, *b*	40×35 μ	60×55 μ	35×30 μ } [4]	50×40 μ } [5]	45×30 μ } [6]	50×40 μ } [7]	70×50 μ	85×65 μ
	,, *c*	—	—	15× 2 μ } [4]	—	10×10 μ } [6]	12× 2 μ } [7]	20× 5 μ	30×10 μ
	,, *d*	—	—	10× 5 μ } [4]	—	—	—	—	25×10 μ
♂♂									
Average of selected series.	Wing length	—	—	0·97 mm.	1·04 mm.	1·03 mm.	1·04 mm.	—	1·89 mm.
	Antennal segments, 3–12 ..	—	—	325 μ	335 μ	300 μ	310 μ	—	515 μ
	,, ,, 13–15 ..	—	—	170 μ	215 μ	170 μ	205 μ	—	310 μ

[1] As the holotype was not found satisfactory for measurement, these are taken from a selected specimen from Lake Denison, Victoria, specimen 461.

[2] This measurement is dubious, the specimen is imperfect in this detail.

[3] From a paratype, specimen 436.

[4] From a paratype, specimen 397.

[5] From a paratype, specimen 415.

[6] From a paratype, specimen 437.

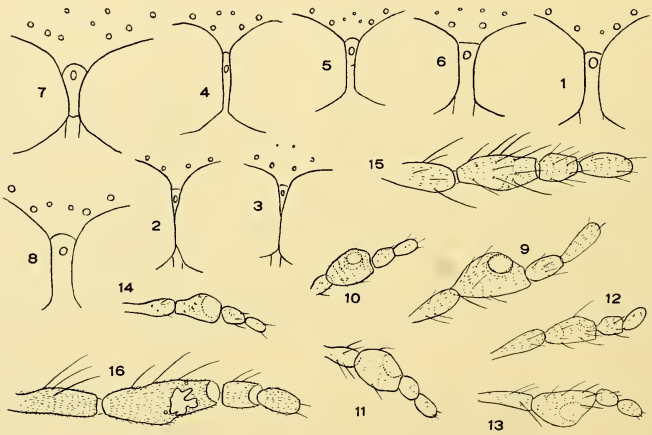
[7] From a paratype, specimen 432.

Distinctive Characters.—*C. williwilli* is, in most characters, close to *C. nattaiensis*, but the wing is distinct from the latter and other species in the possession of two rather boomerang-like elongated pale areas over M_{3+4} and M_2, each partially framing a marginal round pale spot.

Description.—From the type series and other specimens listed below. No pinned material available for details of coloration. Measurements from holotype, and selected series comprising four paratypes. Male measurements from allotype, one ♂ paratype and a specimen from Texas. (See Table 1.)

Female.

Legs with preapical pale spots on the femora, subbasal ones on the tibiae. Halteres pale. Wings (Plate ix, fig. 2) with very complex and distinctive pattern of strong contrast. The large pale area in the intercalary fork is variable; it may enclose a dark spot as in the holotype, or only partially enclose a dark spot running to the wing margin, or be indented distally in various ways or even without any enclosed or indented dark area.



Text-figures 1-8.—Interorbital space of various species (× 190 approx.): 1, *C. coronalis*. 2, *C. williwilli*. 3, *C. nattaiensis*. 4, *C. bunrooensis*. 5, *C. moreensis*. 6, *C. bundyensis*. 7, *C. waringi*. 8, *C. multimaculatus*.

Figures 1, 3 and 5 are from holotypes, 2 is a specimen from Noonameena (425), 4 a paratype (397), 6 a specimen from Texas (430), 7 a paratype (441), and 8 a specimen from King Lake (411).

Text-figures 9-16.—Palp of various species (× 190 approx.): 9, *C. coronalis*. 10, *C. williwilli*. 11, *C. nattaiensis*. 12, *C. bunrooensis*. 13, *C. moreensis*. 14, *C. bundyensis*. 15, *C. waringi*. 16, *C. multimaculatus*.

Figures 9, 13 and 14 are from holotypes, 2 is a specimen from Texas (424), 11 a paratype (436), 12 a paratype (397), 15 a paratype (441), and 16 a specimen from King Lake (411).

Head: The eyes are separated above and contiguous below (Text-fig. 2). Segments 3–10 of the antennae are cylindrical and not much longer than wide, 11–15 are considerably more elongate (Text-fig. 18). Palp with third segment very much swollen, a single round sensory pit on the distal half, IV and V very short (Text-fig. 10). Mouthparts shorter than height of head.

Thorax: Legs unmodified, tarsus IV subcylindrical, tibial comb of four spines.

Abdomen: Two fully developed subspherical spermathecae, each with a distinct duct and one very small spermatheca (Text-fig. 25).